IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Michelle A. Miller, et al.	Docket No.:	TI-31034
Serial No.:	09/742,902	Examiner:	Havan,Thu Thao
Filed:	12/20/2000	Art Unit:	2672
For:	Tracing and Storing Points of Interest on a Graphing Calculator		

APPEAL BRIEF TRANSMITTAL FORM

October 10, 2003

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Bret J. Petersen — 10-16-03 Date

Dear Sir:

Transmitted herewith in triplicate is an Appeal Brief in connection with the above-identified application.

Please charge the $310.00 fee for filing the Brief to Deposit Account No. 20-0668.

To the extent necessary, the Applicants petition for an Extension of Time under 37 CFR 1.136. Please charge any additional fees in connection with the filing of this paper, including extension of time fees, to the Deposit Account No. 20-0668 of Texas Instruments Inc.

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APPEAL BRIEF

The following Appeal Brief is respectfully submitted in support of an appeal of the final rejection of claims in connection with the above-identified application. The final Rejection was mailed 6/6/03, and the Advisory Action mailed 7/11/03.

REAL PARTY OF INTEREST

The invention has been assigned to Texas Instruments Incorporated.

RELATED APPEAL OR INTERFERENCES

There are no appeals or interferences known to Appealant, or Appealant's representative which will directly effect or be directly affected by or have a bearing on the Board's decision in this appeal.

STATUS OF THE CLAIMS

Claims 1-22 were originally filed. No claims were ammended. Thus, the subject matter of the instant appeal is the final rejection of Claims 1-22.

STATUS OF AMENDMENTS

The application was originally filed with Claims 1-22. In an amendment filed on 10/13/00 and a second amendment filed 2/20/01 no claims were amended.

SUMMARY OF THE INVENTION

An embodiment of the present invention is a graphing calculator, which allows the user to easily identify and work with the intersection points of two or more functions. The invention uses a "trace" like function that lets the user quickly jump from one point of interest to the next while displaying the x and y coordinates. The user interface of the present invention calculator helps the student to more readily see and understand the concepts involved with line/function intersection. Similarly, other embodiments include the same user interface functionality in a software application package that is executed on a graphing calculator.

ISSUES

The issues on appeal are whether Claims 1-22 are unpatentable under 35 USC §102(e) as being unpatentable by Tanaka et al. (US 5,907, 317).

GROUPING OF THE CLAIMS

Each set of the rejected claims stand or fall together for the reasons more clearly set forth hereinbelow.

Claims 1, 4, 5, 8, 10, 15 and 18

Claims 2, and 16.

Claims 3, 9 and 17.

Claims 6-7, 11-12 and 19-20.

Claims 13, 14, 21, and 22.

ARGUMENTS

The Examiner rejected claims 1-22 under 35 U.S.C. § 102(e) as being anticipated by Tanaka et al. Applicant traverses the examiner's interpretation of the prior art and the finding of anticipation. Tanaka describes a graph displaying device and method where expression data is displayed with multiple colors.

In contrast, the present invention claims an interface for a graphing calculator or device that allows the user to easily jump the cursor from intersection points and other points of interest. The present invention is not taught or suggested by the Examiner's cited art. The Examiner's response suggests that any movement of the cursor on the screen is a movement to a point of interest. This interpretation is not consistent with the language of the claims and the definition in the specification (page 6, lines 14-15). The specification uses the term point of interest with reference to points such as intersections of lines, or other points of interest could include points such as maximum and minimum. Every point on the screen is clearly not a point of interest. The rejection by the Examiner assumes every point is a point of interest.

Regarding claims 1, 4, 5, 8, 10, 15 and 18. The Examiner has cited col. 9, line 39 to col 10 line 57, for the claim element concerning allowing the user to jump the cursor between the intersection points with a single key command. Applicant is unable to find any such language in this section of the cited art. This section describes using the cursor to

select a box area of the screen. The movement of the cursor is described in connection with the process of identifying a box as shown in Figure 9E. The portions of the graphed lines are then colored depending on whether they lie inside or outside the box defined with the cursor movements. Applicant believes the cited art does not in any way teach or suggest the claimed invention.

The Examiner was invited to point out where in the cited text a cursor is jumped between intersection points with a single key command. In response, in the advisory action, the Examiner cited a large portion of the descriptions where the movement of cursor keys is used to select coordinate ranges (col. 3, lines 21- col.5, line 49; col. 9, line 18 – col. 10, line 46). But in these sections, normal movement of the cursor keys is used to select points for defining a box. "When the cursor keys 12i ... are sequentially operated, the cursor k on the screen is moved rightward and upward" (Col. 9, lines 43-46) Figure 9, which corresponds with this text, implies movement of the cursor in response to the cursor keys in the normal manner – point by point on the display. These newly cited sections also do not teach or suggest the claimed invention.

Regarding claims 2, and 16 and claims 3, 9 and 17: The Examiner claims that Tanaka teaches to display the stored points of interest and use the stored points for other calculator functions. However, in Tanaka, the cited sections deal with storing coordinate ranges, or points of a box to define coordinate ranges, and then these ranges are used for the color marking process of the described calculator function, and not other calculator functions. This does not teach or suggest allowing the user to store points of interest, such as intersection points, and then provide them to be used in other functions.

Regarding claims Claims 6-7, 11-12 and 19-20. The Examiner claims that Tanaka teaches an indication on the display of which equation, inequality or vertical lines contributed to the pint of interest indicated at the cursor location. The Examiner cites figs 5a to 8. These figures do not show "on the display" an indication of what equation provided the points of interest. These figures show graphing equations with different colors to indicated

which graph corresponds to which equation. The claimed invention shows a current equation for a current cursor location. This is not taught or suggested by the cited art.

Regarding claims Claims 13, 14, 21, and 22. The Examiner claims that Tanaka teaches an algorithm to find intersection points using a numerical root-finder which uses XMIN and XMAN for the graph window as the upper and lower bounds on the solution an the initial guess taken as the current cursor position. The Examiner cites a large portion of the text (col. 4, line 26 to col. 6) for this teaching. This portion of the text describes the "coordinate range setting process" (col. 4, line 28). The applicant cannot find any reference to the teaching of using a numerical root-finder to find intersection points which are used to determine the jump points of the cursor.

CONCLUSION

For the foregoing reasons, Applicants respectfully submit that the Examiner's Final Rejection of Claim(s) under 35 USC §102(e) as being unpatentable over Tanaka is not properly founded in law and it is respectfully submitted that the Board of Patent Appeals and Interference so find and reverse the Examiner's rejections.

Respectfully submitted,

Bret J. Petersen
Attorney for Applicant(s)
Reg. No. 37,417

Texas Instruments Incorporated
P.O. Box 655474, MS 219
Dallas, TX 75265
(972) 917-5339

APPENDIX

Claims:

1. A graphing calculator having a points of interest user interface comprising:

a screen capable of displaying at least straight lines in any direction and a cursor;

a key panel having keys at least capable of selecting positions of said cursor and moving said cursor horizontally or vertically on said screen;

a processor for executing programming that provides a points of interest user interface having the following steps:

a) providing an input display to allow the user to define a plurality of equations, inequalities and vertical lines,

b) graph the defined equations, inequalities and vertical lines,

c) provide a points of interest display screen, and

d) allow the user to jump the cursor between intersection points with a single key command on the points of interest display screen.

2. The graphing calculator of Claim 1, wherein said processor is further programmed to store the location of the cursor at desired points with a store command that comprises a single key stroke.

3. The graphing calculator of Claim 2, wherein said processor is further programmed to allow the user to display the stored points of interest and use the stored points of interest for other calculator functions.

4. The graphing calculator of Claim 1, wherein said processor is further programmed to input equations, inequalities and lines using a Y=Editor and an X=Editor.

5. The graphing calculator of Claim 1, further comprising an indication on the display of the current coordinates of the cursor.

6. The graphing calculator of Claim 1, further comprising an indication on the display of which equation, inequality or vertical lines contributed to the point of interest indicated at the cursor location.

7. The graphing calculator of Claim 6, wherein the indication on the display of which function or vertical lines contributed to the point of interest indicated at the cursor location includes the intersection symbol for equations that include the line and does not use the intersection symbol for strict inequalities.

8. A graphing calculator having a points of interest display comprising:

a screen capable of displaying at least straight lines in any direction and a cursor;

a key panel having keys at least capable of selecting positions of said cursor and moving said cursor horizontally or vertically on said screen;

a processor for executing points of interest programming that instructs said processor to perform the following steps:

a) providing an input display to allow the user to define equations and vertical lines,

b) graph the defined equations and vertical lines,

c) provide a points of interest display,

d) allow the user to jump the cursor between intersection points with a single key command which moves the cursor to another point of interest with each key activation, and

e) allow the user to store the location of the cursor at desired points with a store command.

9. The graphing calculator of Claim 8, wherein said processor is further programmed to allow the user to display the stored points of interest and use the stored points of interest for other calculator functions.

10. The graphing calculator of Claim 9, further comprising an indication on the display of the current X and Y coordinates of the cursor.

11. The graphing calculator of Claim 10, further comprising an indication on the display of which function or vertical lines contributed to the point of interest indicated at the cursor location.

12. The graphing calculator of Claim 11, wherein the indication on the display of which function or vertical lines contributed to the point of interest indicated at the cursor location includes the intersection symbol for equations that include the line and does not use the intersection symbol for strict inequalities.

13. The graphing calculator of Claim 8 further comprising an algorithm to compute intersection points using a numerical root-finder which uses XMIN and XMAX for the graph window as the upper and lower bounds on the solution and the initial guess taken as the current cursor position.

14. The graphing calculator of Claim 8 further comprising an algorithm to compute intersection points of linear inequalities to find the points of interest around the boundary of a solution set to the linear inequalities by iterating the Simplex algorithm.

15. A software user interface for a graphing calculator having the following steps:

a) providing an input display to allow the user to define a plurality of equations, inequalities and vertical lines,

b) graph the defined equations, inequalities and vertical lines,

c) provide a points of interest display screen, and

d) allow the user to jump the cursor between intersection points with a single key command on the points of interest display screen.

16. The user interface of Claim 15, wherein said processor is further programmed to store the location of the cursor at desired points with a store command that comprises a single key stroke.

17. The user interface of Claim 16, wherein said processor is further programmed to allow the user to display the stored points of interest and use the stored points of interest for other calculator functions.

18. The user interface of Claim 15, wherein said processor is further programmed to input equations, inequalities and lines using a Y=Editor and an X=Editor.

19. The user interface of Claim 15, further comprising an indication on the display of which equation, inequality or vertical lines contributed to the point of interest indicated at the cursor location.

20. The user interface of Claim 19, wherein the indication on the display of which function or vertical lines contributed to the point of interest indicated at the cursor location includes the intersection symbol for equations that include the line and does not use the intersection symbol for strict inequalities.

21. The user interface of Claim 15 further comprising an algorithm to compute intersection points using a numerical root-finder which uses XMIN and XMAX for the graph window as the upper and lower bounds on the solution and the initial guess taken as the current cursor position.

22. The user interface of Claim 15 further comprising an algorithm to compute intersection points of linear inequalities to find the points of interest around the boundary of a solution set to the linear inequalities by iterating the Simplex algorithm.